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S8	518	barcode adj4 printer	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/05/13 14:52

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S9	4	barcode adj4 publisher	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/05/13 14:55
S10	209	barcode adj4 (verif$8 validat$4)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/05/13 14:56
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S17	45	S4 and S15	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/05/13 15:27
S18	45	S4 and S15	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/05/13 15:59
S21	99	S15 and (minimum maximum) adj2 bid	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/05/13 15:59

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- S13: [OR] (9) S12 and S11
- S14: [OR] (17) S10 and ticket and game
- S15: [OR] (542) auction adj2 server
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Full Text (1247 words)

CODE OF PRACTICE

Barcode and scanning technology has been around for years, but recent reports indicate that there is still considerable room for improvement, as illustrated by the following items.

Scanning Errors Dent Shopper Confidence

Shoppers like scanning, but they don't necessarily trust it. This is the conclusion of some research by Lansdowne Shopper Focus, who have updated a survey originally conducted in 1996. Whilst the majority of the respondents generally approve of the use of barcodes in supermarkets, significant numbers expressed concern about various aspects of the system, notably accuracy and price visibility. Furthermore, this concern appears to have grown over the past two years.

Recent revelations about scanning accuracy seem to confirm shoppers' fears. A Sunday Times investigation revealed several instances of products on promotion at the shelf being charged at full price at the checkout, or reward points not being credited to loyalty cards.

Universal Coding Sets the Standards

A further complexity with scanning **data** is the plethora of codes and product descriptions held in different **databases** through the supply chain. Some users apply the same **barcode** to different products, pack sizes or flavours, whilst others hold a variety of descriptions of the same **barcode** in different **databases**. One example cited by AC Nielsen is a single **barcode** described as "Heinz dressing" in one retailer and "Heinz Weightwatchers reduced calorie salad dressing in a 410g squeezy bottle" in another. Any exchange of such information between

businesses therefore becomes problematic and prone to errors; it is estimated that **barcode** confusions cause order picking errors of between 13 and 20%. A new initiative launched this month may help overcome these problems. A 3i-backed venture called Udex offers an independently managed and verified common **database**, accessible via the Internet, that all members of the industry can use to ensure they are talking the same language. The **database** will also contain additional information which is not currently held within the **barcode**, such as product ingredients.

The system is currently being tested by ⓘAsda in association with ⓘProcter & Gamble, ⓘUnilever and McBride. ⓘACNielsen and ⓘTaylor Nelson Sofres are also involved in the trial.

Signatures Certify Safer Shopping

Despite all the assurances about the security of on-line shopping, the majority of Internet users remain unwilling to disclose their credit card details on the Web. A recent Internet user survey by NOP revealed that only 10% of web-users have shopped online, and that the numbers are rising only slowly. The fear of fraud is quoted as the main inhibition.

A number of initiatives have recently been launched to address this issue. The first is the advent of stronger encryption technology. Currently, most on-line vendors use Secure Socket Layers (SSL) from Netscape, which scrambles digital messages using 40-bit encryption. This level of security has been cracked many times by hackers linking up high-specification computers. However, 128bit encryption, whose arrival is said to be imminent, is yet to be compromised by even the most powerful machines.

This, of course, doesn't prevent unscrupulous traders misusing credit card details once they have received them. Some of the more perspicacious shopping sites now use systems that automatically route your details to a financial institution that authorises the transaction immediately and then **transfers** the funds to the store's bank account. This means the trader never sees your credit card details.

At the Labour Party Conference in September, the Secretary of State for Trade and Industry, Peter Mandelson, unveiled plans for the allocation of electronic signatures as part of an electronic commerce bill. These codes will be as legally binding as a signature on paper, and may be used by individuals to buy and sell on the web, and potentially to claim benefits, pay tax and register births and deaths electronically.

The idea is the brainchild of the DTI's Future Unit, a civil service think-tank which analyses change in the way that business operates. Plans to introduce smart cards, operated using such a signature, are expected in a White Paper on Better Government. The Unit, however, acknowledges concerns that electronic signatures could infringe civil liberties, and recommends that the Government must introduce strict regulation to ensure that data is protected.

Coupons U-pons

Sainsbury's has rolled out on-shelf coupon machines to 150 stores following a successful trial in the south-west. The instant coupon machines (ICMs) offer shoppers up to 15% off brands and own label products at point of selection. These machines have also been tested in Iceland in recent months.

This coincides with news from the US about the development of the U-pon, a money-off coupon available via the Web. ⓘKroger, the US grocery multiple, has joined forces with Planet U, an Internet promotions specialist company, to enable shoppers to download coupons from ⓘKroger's website (www.kroger.com), which are then redeemable at any of their 1,392 outlets.

U-pons achieved redemption of more than 20% when they were introduced earlier this year by the Dick's Supermarket chain in Wisconsin. This figure compares with a typical redemption rate of 2% for traditional coupons. ⓘKroger and Planet U claim that the system will allow them to deliver highly targeted consumer promotions in an effective and cost-efficient way.

Waitrose@working well

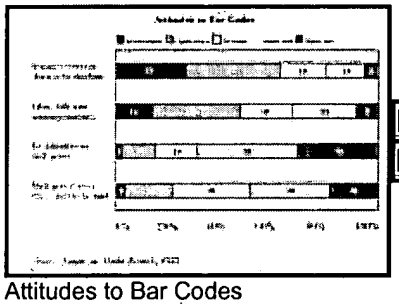
Waitrose@work, the Intranet food ordering system launched in July, has received positive feedback from its first customer. ⓘBritish Airways was the first office to sign up to the scheme, which allows employees to order groceries

from their desks and have them delivered to their workplace the same day. The BA team of testers said they were pleased with the system, and cited examples of Waitrose using their initiative to avoid problems. "I wanted 3lb of carrots and I ordered 30lb by mistake," said one user. "They tried to contact me but in the end used their discretion and sent 3lb."

Other companies showing interest in using the scheme include ⓘMicrosoft, the ⓘBBC and ⓘBarclays Bank.

Quicker Picking

An ingenious new picking system is to be installed at Sainsbury's Rye Park distribution centre, replacing the current paper-based method. Symbol's wearable system comes in the form of a ring that can be worn either on the index finger or on a wrist-mounted computer. Both have an eight-line display, keyboard, battery pack and radio for wireless data communications.



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Attitudes to Bar Codes

This allows employees to use both hands when performing warehouse picking and receiving tasks while scanning bar-code data. Store orders are downloaded to the gadgets instead of being printed out as pick lists. The new system is expected to improve the efficiency of these activities in the depots.

Healing Touch

Further to last month's news that Sainsbury's is to trial interactive kiosks at its in-store pharmacies, ⓘAsda is now installing interactive touchscreen pharmacy information points in 50 stores. The idea is to provide customers with advice on common illnesses and their remedies, product ranging and vaccinations. The Micro Pharmacy information points are already being used in some independent pharmacies, and may provide a vehicle for some ⓘAsda suppliers to advertise and promote their products to shoppers.

Hot Linking as Ovens Go On-Line

ⓘNCR are developing a Microwave Bank which will allow users to shop on-line, surf the Internet, pay bills and check their bank accounts, as well as cook their meals. Touchscreen technology has been incorporated into the oven door to allow programming. The machine also has a bar-code reader with which to swipe empty packaging, thus registering the need to buy a new product. The machines are expected to be available in two to five years, and to retail at around L500.

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Scanning new ground

Hill, Sidney. **Manufacturing Systems**. Wheaton: May 1996.Vol.14, Iss. 5; pg. 46, 6 pgs

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Abstract (Document Summary)

In recent years, the uses for automatic data collection systems have expanded to the point that they can be found in, or linked to, almost any part of a manufacturing operation - the warehouse, the shop floor, even the administrative offices. Manufacturing managers still use automatic data collection for simple functions such as recording the receipt of raw material or employee work hours. However, they also use it to help monitor the quality of both products and production processes. Some manufacturers even rely on automatic data collection to help them allocate and optimize the use of resources. The ability to perform these latter functions, some experts argue, has taken data collection systems out of the realm of simple automation devices and raised them to the level of decision-support tools.

Full Text (2336 words)

ALTHOUGH AN ACCOUNtant by trade, Steve Reding relies heavily on a portable data collection terminal--a device more closely associated with warehouse or production workers--to perform his job.

Reding uses a Janus 2020 hand-held terminal from Intermec Corp., Everett, Wash., to scan bar codes attached to the 1,700 fixed assets spread among 50 buildings at the TRW-Vehicle Safety Systems Mesa II facility in Queen Creek, Ariz., where passenger-side automobile air bags are made. The codes are pulled into a software program

called Fastrack from Best Programs, Reston, Va., which quickly reformats the data and **transfers** it to a fixed-assets database. The information in the database then is readily available for use by the fixed-assets management system Reding uses to calculate and track the current value of all the plant's assets.

Reding, whose official title is fixed assets coordinator, says automatic data collection chopped at least a month off the time it took to inventory all of his plant's fixed assets late last year. His other option for collecting data would have been to carry a note pad around the plant, write down the pertinent information, and then type it into his computer after returning to his office.

"Automatic data collection is so much more efficient," says Reding, who chose the Fastrack program because it integrates smoothly with his fixed-assets database and his assets-management system, both of which are provided by Best Programs as well. "I don't have to worry about the data accuracy, and it feeds right into my fixed-assets management system."

A sign of change

An accountant who scans bar codes is just one sign of the changing roles of data collection in manufacturing. In recent years, the uses for automatic data collection systems have expanded to the point that they can be found in, or linked to, almost any part of a manufacturing operation--the warehouse, the shop floor, even the administrative offices.

Manufacturing managers still use automatic data collection for simple functions such as recording the receipt of raw material or employee work hours. But they also use it to help monitor the quality of both products and production processes. Some manufacturers even rely on automatic data collection to help them allocate and optimize the use of resources. The ability to perform these latter functions, some experts argue, has taken data collection systems out of the realm of simple automation devices and raised them to the level of decision-support tools.

Automatic **data** collection, sometimes referred to as Auto ID, is most closely identified with systems that use a scanning device to extract **data** from a **barcode** label, decode the **data**, and transfer it to a **database** for later use. The direct transfer of measurements from gauges or counts of electrical signals from production machines also has been called automatic **data** collection.

Labels aside, it's clear that automatic data collection has become much more than a quicker way to get information into a database. Gene Trousil, vice president of consulting with USData Corp., a seller of data collection hardware, software, and system integration services based in Richardson, Texas, describes the evolution of data collection this way: "It started out as a simple way to identify something. A bar code was, in effect, a license plate attached to a part, and that license plate was associated with a data file as the part moved through the manufacturing or distribution channel. In time, the bar code was seen as more than just a license plate. It became a carrier of information that was fed into business processes. The bar code is still necessary, because the information has to be accurate. But what's more important today, is that users be able to adapt that information to their own purposes."

Bill Swanton, senior analyst with Advanced Manufacturing Research, a Boston-based consulting firm, says technology advances, especially in the hardware arena, opened the way for the proliferation of automatic data collection in manufacturing. "The biggest trend in data collection today is the restructuring of applications to take advantage of the PC-based terminals that are taking over the market," Swanton says. "The ability to use standard PC tools means data collection systems no longer have to be built around the functions offered by a particular vendor. They can be built around the applications the user wants, whether that is receiving, shipping, inventory management, or warehouse management. A fork-lift terminal is a little different from a hand-held terminal, but everything is PC, and that makes it easier to develop applications for a broader base of users."

Swanton says the advent of radio frequency (RF) data collection networks also has aided the expansion of automatic data collection systems by allowing for the passing of data to host computer systems in real time.

"With on-line systems tied to host computers, automatic data collection can now add value to a company's operation by making it easier for people to do their jobs," Swanton says. "In warehouses, this means stuff is no longer just blindly being put away. It may be cross-docked or stocked in a way that uses less space. Systems are now telling workers to stock material in ways that optimize the flow of material and make the best use of space."

New-found uses

Examples of the varying uses of automatic data collection abound. ⓘAmetek, a manufacturer of motors for floor-cleaning equipment, has tied automatic data collection into the quality-control system at its Graham, N.C., plant. Operators that monitor gauges and other measuring devices attached to production equipment have manuals containing bar codes corresponding to specific defects or out-of-spec conditions that could occur during the manufacturing process. If a monitoring device shows a defect, the worker scans the appropriate code and the information goes directly into ⓘAmetek's quality-control software package, Database for Quality from Murphy Software, Southfield, Mich. This software takes the data and immediately creates charts that let ⓘAmetek managers assess the situation and determine how to correct it.

Mead Johnson Nutritionals, a division of ⓘBristol-Myers Squibb, has a similar link to an on-line analytical processing system at its plant in Evansville, Ind. The Graphical Performance Series (GPS) from Vanguard Solutions, of Glen Ellyn, Ill., is a query tool that lets managers pull specific information out of a manufacturing database to analyze production operations in a variety of ways.

At Mead Johnson, workers mixing formulas for baby foods and other products print bar-code labels spelling out the types and amounts of ingredients being mixed. When the bar codes are scanned, the data goes directly to the host manufacturing system--PRISM from Marcam Corp., Newton, Mass.

Managers then use GPS to pull specific data from PRISM to create analytical reports. Data can be separated and analyzed according to numerous criteria such as by-products, by-ingredients, or numerous other factors. Amber Lippold, director of consulting for Vanguard Solutions, isn't sure Mead Johnson would be using using GPS "if not for automatic data collection."

A management tool

Cameron & Barkley, a distributor of industrial, electrical, and electronic components, started making much better use of its warehouse space after installing an RF data collection network tied to a warehouse management software program from ⓘCambar Software, Charleston, S.C. Workers are linked to the network through hand-held data collection terminals. The terminals communicate with an RF network controller linked to an IBM PC that holds the Cambar warehouse management software. Two other PCs on the network are used for warehouse managers to allocate jobs and monitor workflow.

This network allowed Cameron & Barkley to institute a zone storage and picking strategy, which resulted in a complete reorganization of the company's 40,000-square-foot central distribution center; also located in Charleston, S.C. "Warehouses used to. be organized so each zone in the warehouse was allocated to a specific vendor," says Matthew Pruitt, Cameron & Barkley's vice president and corporate operations manager. "That meant if you started carrying more of a particular vendor's line, you had to expand your warehouse, even if you had empty space somewhere else."

Pruitt says Cameron & Barkley's new system also is helping his supervisors do a better job of managing workers. Supervisors distribute work at the beginning of each day with a goal of having all orders in the system filled by the end of the day. They used to go around throughout the day to see how workers were progressing. Now, with all workers' actions being uploaded to the warehouse management system from the hand-held terminals, supervisors can look on a PC at any time and see how many orders are waiting to be filled. If necessary, they also can reallocate jobs among workers directly through the system.

"Things really changed when we brought this system in," Pruitt says. "Our initial goal was to increase our throughput and decrease errors in filling our orders. We did that, but we accomplished some other things that we didn't expect as well."

Natural evolution

Monroe Auto Equipment Co, is another manufacturer using Auto ID in ways that never were imagined initially. Monroe, a subsidiary of Tenneco Automation, headquartered in Monroe, Mich., has an Auto ID system that tracks its production processes to the point of counting the exact number of times a machine turns a bolt when attaching components to finished parts such as brakes and rear-axle assemblies. The system satisfies a major customer's

desire for an easy method of identifying the specific vehicles involved if a problem arises. Britt Bailey, information systems project leader, says applying automatic data collection to this task was part of an evolution that has taken place since Monroe installed its first Auto ID system in 1990.

That first system was designed to replace a time clock at a Monroe plant in Hartwell, Ga. It consisted of a series of Intermec 9560 badge-reading terminals and software from Data Collection Systems Inc., (DCSI), Eden Prairie, Minn. "That first system streamlined the process of having workers check in, as well as some accounting processes," Bailey says. "Supervisors didn't have to collect cards and check them for errors before taking them to accounting. They could review data on a PC screen, make adjustments, and then upload the information to accounting. That meant payroll got processed faster, and more accurately."

The time-and-attendance system also produced some subtle changes that prompted Monroe management to investigate broader use of automatic data collection. "One of the first things we noticed was that the production lines were actually starting a few minutes earlier in the morning," Bailey says. "That was because workers now had to be at their workstations to clock in, and there was no more lag time between when they clocked in and when they actually began work.

"We also noticed we were collecting a lot of data," Bailey continues, "and we discovered we could use that data in ways that amounted to decision support."

The 'big application'

Monroe's next move was creating what Bailey calls "the big application," its production-tracking system. This system, which has been running at Monroe's Sterling Heights, Mich., plant since 1994, is part of an RF data collection network that once again combines Intermec hardware with DCSI software.

The tracking system starts at receiving, with the DCSI software generating tracking numbers that follow each incoming part through the assembly process. Chrysler, located roughly three miles from the Monroe plant, transmits orders electronically over a dedicated modem link as cars move down its assembly line.

Monroe is expected to fill these orders in the same sequence they are received, and the production tracking system provides proof that this happens.

When orders come in, the DCSI software queries Monroe's order-entry system to extract the data it needs to create labels that will be used on the shop floor. The labels contain bar codes corresponding to the serial number of each specific part going into an assembly. The labels also contain regular text with other pertinent information linking each order with a specific car.

Once the DCSI program creates a label, it sends the order information to a home-grown Monroe program, the Dynamic Module Order Expeditor, or DMOX, which dispatches orders to the shop floor. When DMOX releases an order, it also signals the DCSI program to download label data to a printer in the appropriate shop-floor area.

Operators take the labels from the printer and place them on the correct parts. Each operation involved in building an assembly requires a certain number of torques, or turns, to fit the part in place. And each of these operations is performed with a separate machine, called a torque controller. To meet Chrysler's requirement for product tracking, each torque controller is connected to an Intermec 9560 bar-code reader, the same model Monroe used in its first Auto ID application. The reader is, in turn, connected to the DCSI software.

Before starting a torquing operation, operators must scan both their badges and the bar code on the part they are connecting to the assembly. As the job runs, the DCSI software counts and records the number of torques, and the data is saved.

Bailey says this system is so precise that if someone took the vehicle identification number off any car containing parts built at Monroe's Sterling Heights plant, even if that car were pulled off the road in California two years later, someone at the plant could log onto a computer and easily determine when each part was placed on the car, and how many times each part was torqued, its torque values, and who supplied the part to Monroe.

Bailey says tracking this information keeps Monroe in good standing as a Chrysler supplier, but someday it also

could save both Monroe and Chrysler lots of money. "If they have to recall a car because of a specific problem, and we can pinpoint that only cars built on a certain day, at a certain time, could possibly have that problem, it could greatly reduce the number of cars they need to recall. And that could be a savings of hundreds of thousands of dollars."

That's just one of the many unusual, though no longer totally unexpected, benefits today derived from automatic data collection.

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